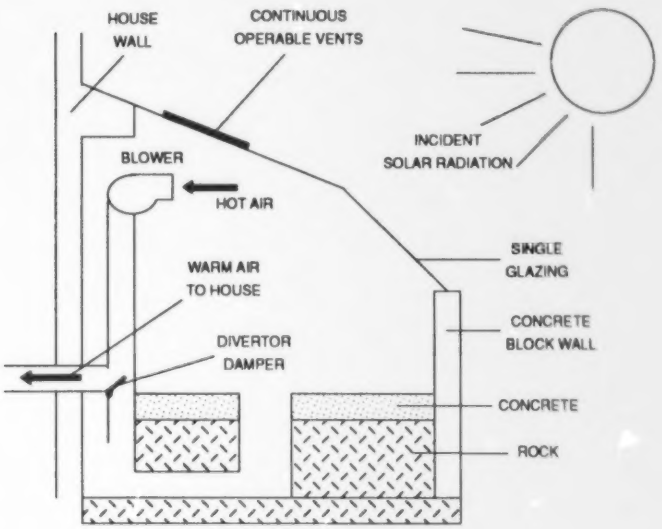
ENERGAIN

Solar and Wind Energy

A report on the Small Scale Energy Demonstration Program

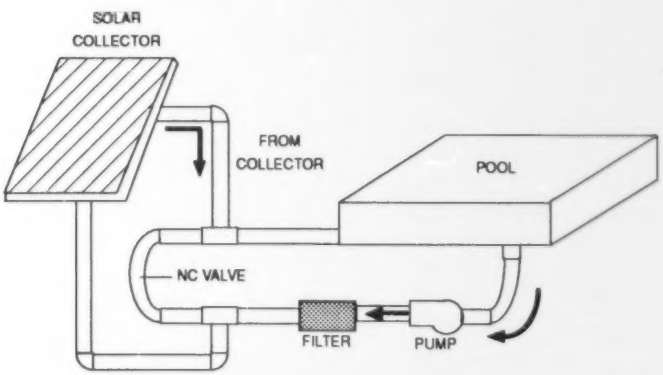
Passive Solar Sunspaces



Dale Sudom and Joan Tucker fitted their houses, both located in Paradise, with passive solar sunspaces. Although these sunspaces add to the overall value of a home, they are not cost-effective at saving energy in Newfoundland. The paybacks for the examples cited exceed 30 years, and the construction costs were $6360 and $10,500.

The Sudom sunspace has proven effective as a buffering zone for one side of the house, and the family has used it as a plant nursery as late in the year as mid-November. The other sunspace has not been used to the same extent, due to excessive condensation on the windows. Careful planning is required to build an efficient sunspace.

Solar Heating for Swimming Pools



The Royal Newfoundland Yacht Club installed a solar heating system at their swimming pool in Long Pond, Conception Bay. The system was turned off after one season due to technical and maintenance problems caused by improper installation. Experienced professionals should always be hired to select and install a solar heating system. Similar systems operated with great success in Prince Edward Island since the early 1980's, with a 2 to 4 year payback. Paybacks of 5 to 8 years should be achieved in Newfoundland.

Another solar swimming pool heating system is in use at the private residence of Neville Kean in Corner Brook. The system functions properly, but the available sunlight is not sufficient to heat the outdoor pool as much as the owner would like.

These projects were assisted by the Small Scale Energy Demonstration Program, which was part of CREDA, the Canada/Newfoundland Conservation and Renewable Energy Demonstration Agreement, funded by Energy, Mines and Resources Canada (80%) and the Newfoundland Department of Mines and Energy (20%).

Department of Mines and Energy

Government of Newfoundland and Labrador

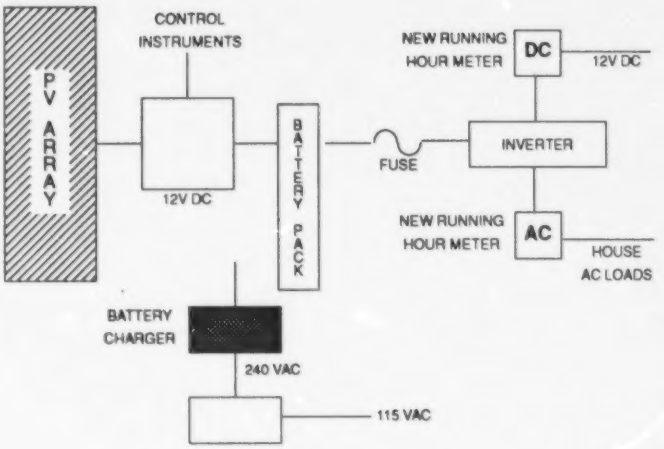
Hon. Rex Gibbons, Ph. D., Minister

90-03790/

Photovoltaic Energy Generation (Solar Electricity)

Bart Higgins constructed a photovoltaic (PV) array system, consisting of solar cells, a number of batteries and a control panel, at his home in Paradise River, Labrador. The solar cells collect the sun's energy, and use it to charge batteries to supply Mr. Higgins' residential energy requirements. This system works well, and provides very low-cost energy to the house, with little maintenance and reliable operation. The total cost of installation was $15,150. Savings of approximately $2000 per year make the simple payback period 7.6 years.

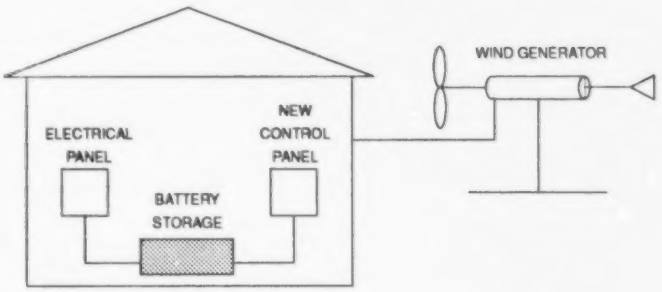
The PV electric generation system, although expensive, has the most long term financial benefits of the solar energy projects funded by CREDA, because of low annual maintenance costs and the complete elimination of fuel costs for electric generation. The success of this project illustrates that an accurate estimation of a system's value must include its annual operating costs, as well as the initial cost.



Wind Energy

Robert King installed a Wind Energy Conversion System (WECS) at his home on Kenmount Hill. Mr. King's wind generator initially had significant maintenance problems. He replaced one set of blades due to delamination and had to replace the lead-acid batteries with nickel-cadmium batteries due to overcharging. The system was intended to produce only enough energy for residential lighting, therefore the economic viability of the project is questionable. Mr. King now feels that if commercial electricity became available he would use a utility inter-tie system instead of the stand-alone WECS, to eliminate the very costly battery system.

Edward Duffy of Aguathuna installed a utility inter-tie WECS. The estimated annual output of this set was 6500 kilowatt-hours, but the actual output was only 25 percent of this amount. This is primarily due to improper matching of the WECS with the wind regime, which causes the system to shut down during peak wind conditions. A payback period of over 20 years makes this particular system impractical. A properly matched system would continue to generate electricity until wind speeds exceeded 160 kilometers (100 miles) per hour.



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